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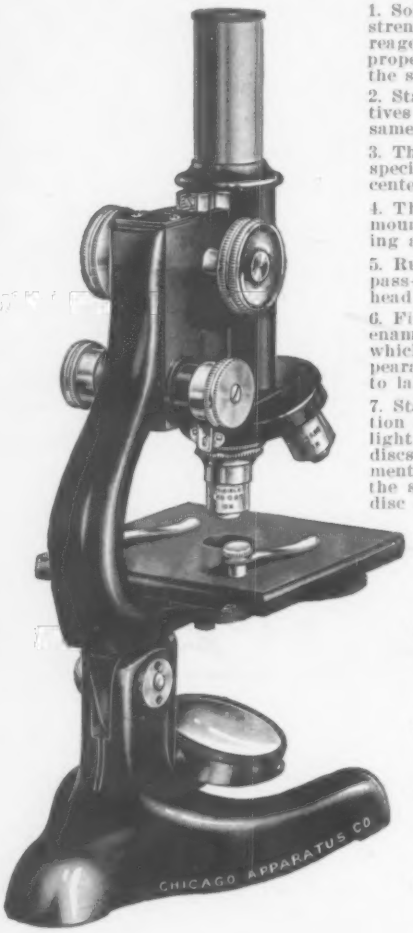

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THE AMERICAN BIOLOGY TEACHER

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A Unit on Conservation in High School Biology

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The following unit on Conservation was developed as part of a reorganized syllabus for the teaching of non-Regents biology in Lafayette High School in Brooklyn, New York. Biology in our city follows a compulsory first year of general science. The first semester in biology is uniform for all students in Lafayette, both for those seeking a Regents diploma admitting the holder to college, and for those wishing only a general, non-Regents diploma. It includes the topics of cell studies, plant and animal physiology, with special emphasis on human physiology, and the introduction to bacteriology.

For candidates for a Regents diploma, the second term is prescribed by Regents requirements, and little variation in subject matter is possible. Included are the major portion of the topic of bacteriology, vegetative and sexual reproduction in plants and animals, embryology, genetics, and evolution. In the non-Regents classes, however, it is possible to experiment, to modify, or to substitute subject matter as the abilities and interests of the students dictate, or force of circumstances indicates.

It is under these circumstances that it was possible to introduce the topic of conservation at a time when the world food shortage, following upon nation-wide dust storms and floods, has skyrocketed the subject into a position of major interest. To make room for it, all subjects but the topic of bacteriology have been simplified and somewhat abbreviated. In several classes they were almost entirely omitted, and in their stead was substituted a practical course in gardening, which served as a basis for the teaching of biological principles. While this unit is intended for a three weeks study, it may be taught for a longer or shorter length of time in various classes, and in whole or in part.

The teaching devices suggested can easily be improvised from materials available in any school laboratory. In rural schools, natural phenomena in the environment may serve the purpose bet-

ter. There is ample room for individual ingenuity. The bibliography makes no pretense of being complete. The wealth of available material gives a wide choice to any teacher.

What the writer hopes to accomplish with this unit is the recognition of the close interrelationship of the welfare of city and country, farm and forest, from ocean to ocean, and for that matter with all the world. The student must see that what the Kansas farmer plants, and in what manner, helps to determine how much soil will be carried off by wind and rain; the rate at which Wisconsin fells its forests decides whether a river a thousand miles away, fed by Wisconsin tributaries, will flood a city; how rapidly the Oklahoma farmer depletes the mineral content of his soil determines the number of jobs that may be available in California; the rate at which hunters exterminate carnivorous animals in our west decides how much of the wheat crop will be ravaged by the rats those animals might have eaten. Specifically the writer tries to point out the following:

1. No widespread change in either biological or physical environment can occur without repercussions on the welfare of man.
2. Sporadic attempts at improvement may result in interference with the balance of nature, which still further upsets the very conditions they are designed to improve.
3. Coordination of all projects is a prime necessity. An independent venture, however well intentioned, may destroy a pattern and turn back the biological clock by years.
4. Farm and forest practices are closely interwoven with the welfare of cities. The nation is a unit.
5. Conservation is a suitable medium for the teaching or review of biological principles. For example, the part of forest in flood control and rain distribution is intelligible only in the light of some knowledge of photosynthesis and transpiration.
6. An interest in conservation may develop an intelligent interest in the world outdoors in students who know only the city.

So intertwined are the topics that division into separate headings becomes arbitrary. This unit is subdivided into four main topics, *Soil*, *Forests*, *Herbaceous Plants*, and *Animals*, followed by a survey of the interdependence of the welfare of plants, animals, and man, and the dangers of haphazard planning. The limitation of space forces presentation of all topics but one in the form of a summary, only the second, Forest Conservation, being offered in detail.

I. Conservation of Soil

Under natural conditions, soil is usually covered by vegetation, ordinarily grasses or forest. Both by the binding action of the roots and the obstruction offered to wind and rain, erosion is slowed or prevented. When farmers disturb this natural cover, as in a corn field, the soil between individual plants is exposed, and easily lifted by wind or washed away by rain. During a dry season, when even the corn crop fails, dust storms may carry off the top fertile layer of soil, permanently depleting the land and necessitating large-scale migrations. Methods of checking such loss have been developed. Among them are the planting between corn stalks of small plants which, drawing on a higher level for water and minerals, do not compete with the corn crop for these necessities, yet aid in stabilizing the soil, and afford an additional paying crop. Strip-cropping or checkerboard planting tends to check rain rivulets. On hillsides, contour farming obstructs the downward path of rain water. Belts of trees, which may well also be paying crops, obstruct wind and soil movement. Rotation of crops and plowing under of clover or other leguminous plants to replace nitrogen in the soil prevent depletion and possible forced abandonment of the farm.

In the city high school, the above principles may easily be illustrated on miniature "plots" contained in shallow boxes, using electric fan and sprinkling can or water tap to imitate erosive action on all forms of land, bare and planted, flat and hilly, with close cover or with plants set far apart, with parallel, contour or checkerboard plantings. Further, the corrosive effect on vegetation of the pollution of soil and water by industrial by-products may be imitated by the use of water treated with appropriate chemicals or by exposing plants under bell jars to fumes, such as ammonia or acids.

II. Conservation of Forests

This topic is treated in full following the summary of the others. The details follow on page 136.

III. Conservation of Herbaceous Plants

It is impossible to separate this topic from the topics of soil and forest.

That the stability of the soil depends upon the binding action of roots and the obstruction offered to wind and water rivulets by the plant bodies above ground may be easily illustrated by the simple classroom equipment described under the topic of Land Conservation. The models may be about a square yard in area. Grass is an effective plant.

Herbaceous plants are intimately related to their biological and physical environment. Those whose habitat is the forest floor, for example, are dependent on the shaded environment offered by the forest, and die with the forest. Such loss inevitably results in death by starvation of birds and mammals for whom they are a chief source of food. Since most birds feed also on insects, this results in multiplication of many forms of insects which destroy food crops and valuable trees.

Another case in point is the wholesale disappearance of ducks from areas where the drainage of ponds has eliminated duckweed, the chief food of the migrating duck.

IV. Conservation of Animals

One cannot divide animals into harmful and useful. Depending upon circumstances, any animal may be either. Rabbits are the farmer's worst enemies in Australia, where natural enemies of the rabbit are absent. The bobcat, on the other hand, if not too numerous, is useful in our own west in destroying rodents.

V. Interdependence of the Welfare of Plants and Animals and Man

Extermination of any one species upsets the balance of nature. Total destruction of a predatory animal like the bobcat in a given region may mean loss of crops to rodents. Any change in biological or physical environment destroys some forms of life and encourages others. Problems of aquatic life are inseparable from general problems of forest and land. Deforestation of an area may cause streams to dry up, or kill fish that require shaded streams. Erosion of land causes streams to flood, killing aquatic animal life in need of shallow, quiet water, and damaging human habitations. The literature on conservation contains countless illustrations of this. For example, overpopulation of sheep or deer on a hillside has been known to result in such close cropping of grass that erosion followed, bringing floods to the countryside. Water polluted by industrial by-products can no longer support life. Shellfish in the vicinity of many large cities, such as New York, are inedible because of sewage infection.

VI. Need of Coordinated Planning Authority

The multiplicity of agencies with overlapping authority has frequently resulted in confusion. For example, shrubbery planted to provide cover for game animals was destroyed soon after by the cutting of a road through the shrubbery. Clover patches were no sooner planted for the use of deer than they were replaced by a grove of trees. A stream was stocked with trout only to be drained immediately afterward. Coordination in planning is urgently needed.

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TOPIC II. CONSERVATION OF FORESTS

Subject	Demonstrations, Class Activity, Discussion	Outcome Ideas
I. Forests and soil fertility See Gustafsen, Ries, Guise, Hamilton (GRGH), page 46, map of relative amounts of forest lands in the states.	1. Exhibit rotting leaves from woods to show origin of humus. 2. Exhibit humus. 3. Discussion—Why is humus richer in nitrogen than other soil? 4. Nitrogen and growth (protoplasm) 5. What is the effect of herbaceous plants growing between trees?	Minerals, especially nitrogen, removed from deeper layers of soil by roots of trees, are put back into humus by rotting fallen leaves. Smaller plants draw minerals from higher levels than trees. They also enrich the soil when they die and disintegrate.
II. Roots as soil binders	1. Remove an old potted plant, soil and all, from its pot. Show spreading of roots and packing of soil between roots. Refer to unit on land. 2. Tree roots often reach as deep as the tree is tall and about as wide as the circumference of the tree top. 3. Trees, shrubs, and herbaceous plants have roots of varying length.	Because forests have plants whose roots reach varying depths, the soil is tightly held against the forces of erosion.
III. Forests and flood control See GRGH page 215.	1. Demonstrate plants use soil water for photosynthesis. 2. Demonstrate transpiration. Plants take more water from soil that they use in photosynthesis because minerals in soil water are in dilute solution. 3. Show that identical quantitiy of same soil in similar pot, but without plant, permits more water to run through to saucer than with plant. 4. Show humus lets water through more slowly than ordinary soil or sand.	Forest plants remove so much water from the soil that less rain water reaches underground streams which feed rivers and lakes. Thus flood danger is reduced. Humus is a deterrent to floods.
IV. Forests and rainfall See Parkins & Whitaker (PW), pages 275–278.	1. How does transpiration affect rainfall? 2. Why are forests being planted in Egypt?	Water that might have caused floods if allowed to sink into underground streams is evaporated by trees. Air currents distribute this water vapor great distances, where it falls as much needed rain. Egypt's dry climate has been modified by forests.
V. Forests as snow brakes	1. Drifting of sand at beaches is retarded by fences. 2. Snow drifts are similarly retarded by fences in our western states, where prevailing westerly winds are strong. 3. Why is the use of tree belts more economical than that of fences? 4. How do huge snow drifts increase flood danger in spring? If snow is evenly distributed, no underground springs are overfilled, thus reducing the danger of flooding the rivers and lakes they feed.	Belts of trees can serve as snow brakes and reduce danger of floods, while at the same time bringing other benefits accruing from forests. Tree crops also bring added income.
VI. Evils of planless use of forests	1. What are some of the ways in which forests are wasted? a. Cutting trees too young to be of much value b. Failure to replant c. Insect pests d. Forest fires e. Indiscriminate replacement of forests by farms 2. Remedies a. Planned forests 1) Trees should be selected to serve as many purposes as possible. 2) Trees should thrive in the specific climate. 3) Trees should have crop value as well as lumber value. b. Replanting as fast as cutting c. Conversion of depleted farm land into forest land d. Control of pests (See unit on animals) e. Education of public to accept responsibility, such as willingness to vote funds 3. Use of forests as play areas 4. Forest rangers as guardians of forests	Forest owners have an obligation to the public welfare, which coincides with their own welfare. Damage to the economy of the country by mismanagement of forests is too serious in its results to be permitted to continue. City populations are especially benefited by play areas.

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Annual Conservation Contests in Western New York

MABEL H. JAMES
Holland, New York

In order to focus attention on natural resources and on public and individual responsibility for their wise use the CONSERVATION FORUM of Buffalo and Western New York each year offers prizes for conservation posters, essays and group projects. By publicizing school accomplishment the Forum hopes to increase interest in this phase of education. The winning posters themselves are used as part of a month long Conservation Exhibit in the Buffalo Museum of Science and are later loaned for additional exhibits, all of which helps to spread the message of the necessity for guarding our vanishing resources. Furthermore, through interesting children in living things and their relationships it is hoped to enrich their lives and help them toward intelligent citizenship.

At the annual School of Conservation at the Museum May 4, 1946, over $100 was distributed to winners in the various classes, among them the two whose papers accompany this notice. Again in 1947 prizes are offered, this time with an ad-

ditional class for short one act plays of entertainment and educational value. Final date for entries is March 29, 1947. Further information and educational material will be supplied by the writer on request. Schools in the 7th and 8th judicial districts of New York state are eligible.

The accompanying article by Mrs. McMurtry is the project report which won first award. The article "Poisons of Nature" by twelve-year-old Carol Norton, was a winner in the essay class (limit, 400 words).

Conservation Education in a Special Science Class

EDNA HEWES McMURTRY
Wellsville High School, Wellsville, New York

This class includes children who have been retarded through some physical handicap, such as hearing, sight or a low mental capacity. Many will leave school as soon as possible, but all will become a part of the community and it is the aim of the Special Curriculum to give them as much material as they are able to grasp which will better their status as citizens.

More than any other subject in the school science is intimately connected with living material; it can be of great value to this group since it teaches:

1. accurate observation—through the scientific method;
2. independent thinking—instead of always following others;
3. ways in which to improve and control environment;
4. responsibility to fellow students, fellow citizens and to other nations by showing the interlocking of all life;
5. necessity for conservation on all fronts if we wish to maintain our mode of living.

The general topic, *Our Environment*, had the following divisions:

I. Matter and Energy—foundations of science
   A. Air and its composition
   B. Air pressure
   C. Light
   D. Heat
   E. Water and soil

Simple experiments showed the relation of each to life, and our dependence upon conservation to maintain our needs.

II. Life Around Us
   A. Trees
      1) Activities
         a) Trips for gathering specimens
         b) Making of posters with twigs and with leaves
         c) Preparing different types of wood and mounting
      2) Study of trees as our great national resource
         a) The forest
         b) Many uses of wood
         c) Care of trees and forests, including fire prevention, reforestation and conservation
   B. Birds
      1) Recognition of common winter and summer birds
      2) Keeping a bird list
      3) Studying birds' nests (nests of 24 kinds now on display, ranging from hummingbird to crow)
      4) Study of migratory habits and tracing of routes on maps

5) Study of birds as garden friends; their great contribution through their feeding habits; assembly addressed by a naturalist, Mr. Jack Schmahl, on "The Economic Value of Birds"

C. Plant life

1) Plants as supporting all life, supplying:
   a) foods
   b) medicines
   c) clothing
   d) shelter and fuel

2) Wild flower recognition, with emphasis on those which need protection, through:
   a) field trips
   b) making of placques of different flowers
   c) making of posters to show need of conservation

D. Ourselves

1) This will follow after Easter and will be a simple Health program aimed at bettering life through healthier bodies, clean minds and a love for the less expensive but more wholesome activities in the out of doors

III. Methods and Aids

A. The field trip, for observation of life forms and for gathering material for later study; many trips taken on school grounds, through nearby park, along river and elsewhere.

B. The classroom museum, with living material brought in by the pupils, including pets and wild animals, as follows: (the smaller creatures housed in a large terrarium)

1) animals

flying squirrels	spring peeper
wild rabbit	tree frog
pet white rabbit	leopard frog
muskrat	green frog
house mice	wood frog
deer mice	red newts
box turtle	purple salamander
painted turtle	spotted salamander
garter snake	toads and tadpoles
red-bellied racer	

2) additional forms in aquarium

sunfish	caddis worm
rock bass	giant water beetle
suckers	water scorpions
crayfish	dragonfly nymphs
snails	diving beetle

3) plants in terrarium reproducing woods conditions

violet	purple horntooth moss
foam flower	haircap moss
partridgeberry	white pine
wintergreen	hemlock
shining club moss	Christmas fern
trailing club moss	marginal fern
treelike club moss	common wood fern
common club moss	oak fern
reindeer lichen	

4) plants in terrarium providing swampy area

pitcher plant	Labrador tea
sundew	cotton grass
sphagnum moss	sweet fern
cranberry vine	buttonbush

The accompanying exhibit includes conservation posters, mounted articles from the school paper, wild flower placques and nature study booklets.

Poisons of Nature

CAROL NORTON
School 63, Buffalo, New York

Every autumnal season brings with it both beauty and terror. In black headlines appears the fateful news, "Whole family wiped out by poisonous mushrooms."

"Toadstool" is the name very often given to non-wholesome mushrooms. While many of these fungi can be eaten in safety, others, which can be distinguished only by an expert botanist, prove to be deadly. Between these two extremes are some which, when consumed, cause serious illness but are usually not fatal.

The characteristics of the common edible mushroom are its pink gills and brown spores. Usually it has no cup. A few of the most common edible mushrooms are the *Parasol Mushroom*, *Inky Cap*, *Oyster Mushroom* and the *Chanterelle* or *Little Goblet*, so called because of its cup-like form.

Deadliest of all mushrooms is the Death Cup, which is sometimes referred to as the Destroying Angel. It may be found during the months of June, July, August and September. Dark woods are its favorite place of refuge. The poison of this fungus acts like the venom of a rattlesnake, separating the corpuscles of the blood from the serum. In addition to this there is also the Fly Mushroom. This can be found along the roadside, and identified by its scaly bright red, yellow, and orange cap. Also, often many dead flies are found surrounding the plant. A little of its juice in a saucer proves to be a powerful fly poison. The poison, when consumed, paralyzes the nerves which control the heart action. Many other poisonous mushrooms can be found in or near woods and meadow, such as Satan's Mushroom, Green-gilled Mushroom, and *Russula Emetica*. Be careful what you eat. Protect your family! Watch out for poisonous mushrooms!

FILMS FOR HEALTH EDUCATION

A new technique in health education, which will utilize specially prepared films for supplementing a popular textbook used in college freshman hygiene courses and adult education groups, has been revealed by McGraw-Hill Book Company, Inc. Marking its entry into the educational film field, the company has started production of a series of seven 16-mm. sound motion pictures and a like number of coordinated silent filmstrips on vital health subjects, designed to correlate with and supplement *Textbook of Healthful Living* by Harold S. Diehl. Instructors' manuals will be provided, with suggestions on making effective, integrated use of these teaching materials. Selection of film subjects has been directed to those parts of the course most difficult for the student to understand, as determined from replies to a questionnaire sent to users of the text, and to those parts of the book that can be more effectively presented in the visual medium. The films will employ the same approach to the subject and the same terminology as the book, but will go beyond the book treatment by presenting additional information and taking advantage of the inherent expository capacities of the film medium.

Subjects of the seven motion pictures are: Body Care and Grooming, Personal Health, Care of the Ears, Nose and Throat, Group and Public Health, Immunization and Vaccination, Sex Education, Mental Hygiene. Each motion picture will be accompanied by a coordinated silent filmstrip, planned as a follow-up to the corresponding motion picture. The filmstrip presents additional factual material, asks questions, and re-emphasizes key points in both textbook and motion picture. This type of film is valuable for class review, for oral discussion or examination, for lecture illustration, or for study by small groups or even by individuals out of class.

The Text-Films on health education are being produced for McGraw-Hill Book Company, Inc., by Audio Productions, Inc., well-known motion picture producers of New York City.

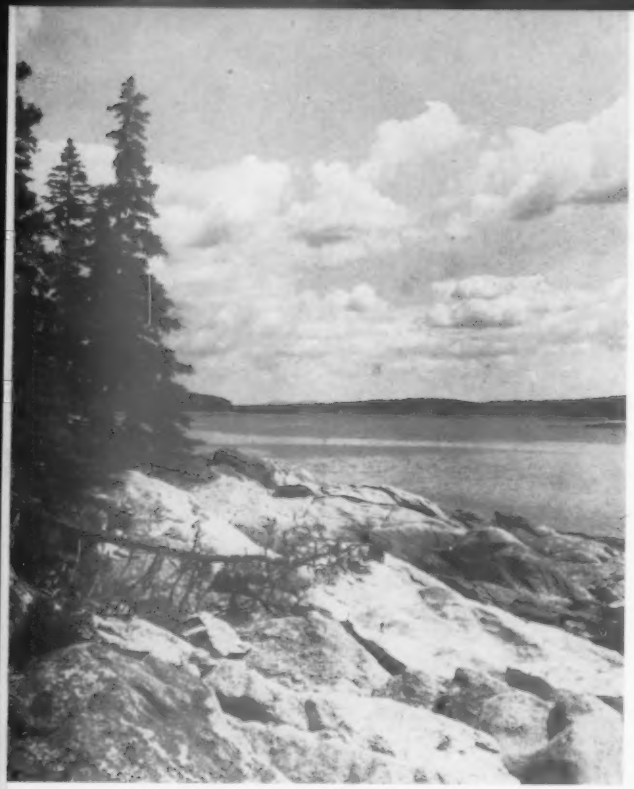
View from front of Audubon Nature Camp. Photo by Lacroix.

Summer School at the Audubon Nature Camp

DONALD S. LACROIX
Amherst High School, Amherst, Massachusetts

For the person interested in general biology, natural history, bird-study, or conservation of natural resources; or for the person interested in teaching in any of these fields, a two-week summer session at The Audubon Nature Camp offers much in the way of practical experience and in the way of refresher courses that cannot be acquired at many summer schools. Located as it is, in Muscongus Bay on the coast of Maine, a wide variety of plant and animal associations is at the very elbow of the student. Bleak, rocky, tree-less islands, upon which nest some of the rarer forms of bird-life as well as some of the more common gulls and terns are within reach of the birdlover. Spruce- and fir-covered islands left in their original state are carpeted with many forms of mosses, lichens, ferns and fungi that delight the heart of the botanist; and the variety of rocky shores, small beaches, tide-pools, salt marshes, and fresh water streams contain a wealth of material for the student of marine life; insects of these many associations provide a rich field for the entomology student and insect collector. Also, the near-by mainland has its typical habitats for still other forms of life that do not exist on the islands. Nature's laboratory is within the reach of the biologist in its most complete form.

The Audubon Nature Camp is located on the northern tip of Hog Island near Medomak, Maine, and comprises some



Typical scenery at Hog Island, Muscongus Bay, Maine, on which the Audubon Nature Camp is located. Photo by Lacroix.

ten or a dozen buildings—dormitories, laboratory, lecture hall, headquarters and dining hall, miscellaneous buildings housing the power plant, lavoratories and shower-bath facilities, pumping stations, etc., are scattered through a spruce-fir forest. Two large motor boats furnish transportation to and from the mainland and carry students on field trips to other islands.

Courses

The student is required to take courses in Nature Study and Bird Study and one elective from the following: Marine Biology, Plant Biology and Insect Biology. The underlying philosophy of all the work at the camp is conservation of wildlife resources and the interdependence of plants, animals, and man. Each student is furnished with outlines for teaching conservation, ecology, plant-life, bird study, etc.

Nature Study

This course is ideal for all teachers who want to get ideas and concrete suggestions for teaching natural history and elementary biology in the grammar and junior high school grades as well as for the high school teacher who has had little or no practical experience in preparing laboratory demonstrations, aquaria, terraria, exhibits, models, slides, charts, and various other devices. There is also a lot of general science on weather, soils and elementary geology that can be used effectively in the classroom from grade one through grade nine. Conservation is the keynote throughout all the Nature Study course.

Bird Study

In the work covering bird study, the student is taken afield to see many of the common upland forms in their nature habitat and to the coastal islands to observe water birds. Some of the rarer birds such as the Leach's Petrel and Double Crested Cormorant are seen nesting and gulls and terns are found in all stages of development. The student is given the opportunity to learn how

Young Double-Crested Cormorants, almost extinct on eastern seaboard in 1931, now breeding by the thousands on bleak island near the camp, thanks to Audubon Society's campaign to prevent extinction. Photo by Lacroix.

Upper left: Eggs of Herring Gull, found on many of the neighboring islands. *Upper right:* Marine biology class checking over specimens just collected from two dory-loads of kelp harvested a few hundred yards off shore. *Lower left:* Rock Snails (*Thais lapillus*) and egg capsules found on rocky shores at low tide under the protective coverof sea-weeds. *Lower right:* Immature Great Blue Heron. All photos by Lacroix.

to identify the various species from field markings, song, method of flight and habitat. Motion pictures in natural colors supplement the field work. Here again, conservation and inter-relationships are stressed.

Marine Biology

The coastal waters abound in the many forms of marine life which are usually presented in preserved form to the ordinary biology student, but here he is able to see, collect and observe the natural reactions of all sorts of snails, clams, mussels, lobsters, crabs, fishes, and microscopic floating forms called plankton. Deep-sea forms are dredged, shallow tide-pool forms are studied in their natural situations; salt marsh associations of forms are examined as they exist, not in pictures; fresh water ponds and streams on the mainland are also given a "thorough going-over." Material collected is brought into the laboratory for further observation in aquaria or under the microscope or both. Supplementing the field work are illustrated lectures on the lobster, the oyster, food fishes and the importance of the industries involving each.

Plant Biology

Here again the student is taken afield to observe plant associations and is given the opportunity to learn to identify most of the species common to the northeast. Many forms of ferns, lichens and mosses that are not found elsewhere, grow in abundance

here. The islands present a spruce-fir cover that is typical of the Canadian zone and which has not been cut over for pulp-wood, so the forest is very dense. On the adjoining mainland certain other types of plant life abound which serves to round out the student's observations.

Insect Biology

Elementary entomology is very effectively presented by going on collecting trips and bringing back material to be identified at leisure in the laboratory. The student is given keys for "running down" each type and has a real chance to learn the use of systematic keys for just this purrpose. At the same time he can build up a collection of his own for later use in the classroom in his own school.

teaching, lecturing, and writing. They give freely of their time to each individual so that a school teacher or nature-lover can work out his own problems under qualified guides. The outstanding characteristic throughout the staff is a sparkling atmosphere of tremendous enthusiasm for the work.

THE STUDENTS

The student body is made up of science supervisors from large school systems; school teachers of kindergarten and grade one through grade twelve, coming from both public and private schools. There is also a smattering of lecturers, nature-lovers, garden-club members and photographers of natural history. The enrollment lists contain names of students from all over the United States and Canada. Most of the school systems send their teachers with all expenses paid—tuition, travel, and incidentals.

No academic credit is given for the work, but each person who satisfies the staff that he has completed the work is presented with a certificate.

THE SCHEDULE

Monday through Saturday			*Sunday*		
6:30	A.M.	Reveille	7:30	A.M.	Reveille
7:00		Breakfast	8:00		Breakfast
8:15		Assembly	9:00		Recreation, Reading, Study,
8:30 to 11:30		Field Trips and Instruction	to 12:00		Field Trips, Swimming, Boating, Church (on mainland)
12:30	P.M.	Dinner	1:00	P.M.	Dinner
1:30 to 2:30		Rest and Study	2:00 to 3:00		Free
2:30 to 5:30		Field Trips and Instruction	3:00 to 5:30		Field Trips
5:30 to 6:15		Free	5:30 to 6:15		Free
6:15		Supper	6:15		Supper
7:30 to 9:30		Illustrated Talks, Discussions, Entertainment, Free	7:30 to 9:30		Illustrated Talks, Campfire, Free
10:00		Lights out	10:00		Lights out

THE INSTRUCTORS

The teaching staff is comprised of specialists in each subject, most of whom are nationally known. They are especially equipped to teach teachers, and know the problems with which teachers are faced in the classroom. These instructors are not novices, but are experts who have devoted their lives to research,

Biological Briefs

SCHMITT, FRANCIS O. *The Electron Microscope in Biological and Medical Research.* The Science Counselor 19: 67–68. September, 1946.

This up-to-the-minute paper deals with the recent advances in biology and medicine that have been made by using the electron microscope. In the short space of only five years since the electron microscope became available in this country, plant and animal viruses have been studied. Some that have been studied with success are the viruses causing such serious diseases as poliomyelitis, rabies, encephalitis, and others. Bacterial viruses called bacteriophages, are seen to possess a small head and a thin short tail, resembling a tadpole.

Not so long ago it was supposed that molecules would never be visualized directly. Now with the electron microscope giving a useful magnification of over 100,000 times, the larger protein molecules, like hemocyanin, and several smaller ones as well have been revealed. The new technique of shadow casting is extremely valuable in dealing with these small particles.

Dr. Schmitt shows with some detail how the electron microscope works, and explains the techniques by which the biological studies have been made. He predicts that ". . . we are on the threshold of the greatest era of discovery in the entire history of biological science."

Erythrin Vs. Diphtheria. Science News Letter 50: 292. November 9, 1946.

This penicillin-like antibiotic called erythrin is extracted from red blood cells of rabbits. It is reported by Dr. L. A. Silber of Moscow, Russia, to be very effective against different kinds of disease germs and particularly against the germs of diphtheria. Diphtheria patients and healthy carriers of diphtheria germs are at present being treated with erythrin, according to the report. Firsthand account of this new antibiotic is being given American scientists by Dr. Vassily V. Parin, secretary general of the Academy of Medical Science of the USSR and Professor of Physiology at the Third Moscow Medical Institute.

A report is also being made on the famous K.R. anti-cancer vaccine under trial in Russia. This vaccine comes from a protozoa. Some but not all of the few breast- and skin-cancer patients treated have recovered clinically. However, not unless and until they have remained free of cancer for five years will doctors in Russia or elsewhere be satisfied that the vaccine is a cure for cancer. Dr. Parin suggests that a whole new branch of the science of antibiotics may be opening as a result of this recent discovery of erythrin.

GORDON, ROBERT B. *Vitamin B_1 Activation of Protoplasmic Streaming.* The Educational Focus 17: 18–21. Fall, 1946.

The common water plant *Elodea* is probably the favorite plant used to detect movement of the chloroplast. The choice parts of the plant are the young leaves within an inch or two of the tip of the stem, and the cells near the midribs of these leaves are usually the most active. The results obtained from mounting these choice leaves in tap water alone, however, is often disappointing, as there is little or no movement of the chloroplasts.

Mr. Gordon says very good results have been obtained in his laboratory by adding a few drops of Vitamin B Complex solution to the water mount. The solution is prepared by dissolving approximately half of the contents of a gelatin capsule Vitamin B Complex (Lederle) in a half pint of water. He suggests that *Elodea* even under the most favorable conditions is likely to be deficient in thiamin because it is a water-soluble vitamin, and because it diffuses readily through non-cutinized cell walls. The author also calls to the readers' attention how this increased activity of the chloroplasts when Vitamin B_1 is added demonstrates the effect of this important food element. It is an excellent occasion to emphasize the dietary importance of adequate Vitamin B_1 intake at all seasons of the year, particularly when the calorie intake is increased or when there is a great loss of fluids by perspiration or kidney functions. The water-soluble Vitamins B and C are easily acquired from the proper foodstuffs and various synthetic sources, but they are just as easily lost. Unlike Vitamins A and D, they are not retained in the body for several weeks following their intake.

EIFERT, VIRGINIA S. *The Bird Explorers.* Nature Magazine 39: 461–464, 498. November, 1946.

Ever since the Pilgrims came to Plymouth, men, with unending enjoyment, have been discovering and naming American birds. Some birds reminded the homesick settlers of birds in England, so many of them received familiar English names. For example, they called our russet-breasted thrush a robin; our finches sparrows; our falcon a sparrow hawk. They named our redwings and grackles "blackbirds" even though they are orioles. But the greater number of our birds lived wild, free and unnamed through-

out the tremendous unexplored continent until such explorers and naturalists as Mark Catesby, Alexander Wilson, William Swainson, George Ord, Lewis, Clark, Sir John Richardson, Audubon and many others came and passed by their habitats. At that time there was no systematic method of determining names nor standard authorities on American birds. It was a completely unexplored field. Only a few of the birds these men found bear their names, for it was not the practice for the naturalist to give the newly discovered bird his own name. Birds named after naturalists acquired their names from the man's friends rather than the discoverer himself. Linnaeus named many American birds which he never saw. He named them from other men's descriptions, from their drawings and some from dead specimens. Gradually as the birds received names from various sources there were a few of the finders' names attached to them. For example, Swainson's hawk was named for the naturalist William Swainson, by Prince Charles Lucien Bonaparte, brother of Napoleon; the chattering nuteracker of the Rockies was called Clark's nuteracker after the explorer Clark; Lewis' woodpecker was named after the other member of the expedition; Audubon named the Townsend's solitaire after his friend Dr. Townsend, and the list could be continued much farther. Birding in those days was not always a gentle pastime and it seems only fitting that some of these names should remain as an enduring witness to those who sought new birds so earnestly.

SHARRITT, GRACE V. *Homecoming of the Elk.* Audubon Magazine XLVIII: 348–354. November–December, 1946.

Near Jackson, Wyoming, is located one of the most picturesque wildlife refuges in the nation. This is the National Elk Refuge. This area has the largest concentration of elk in the world. In 1945–46 the Jackson Hole herd was estimated at about 15,000. Some time in November each year, about half of this vast herd from the headwaters of the Snake River and timbered slopes of the Gros Ventre migrate down to the National Elk Refuge. It is the certain food and shelter that prompts this great migration. Before the establishment of the refuge, thousands starved each winter, and thousands more ate from the rancher's hay piles. It was a toss-up whether the ranchers or the elk would control the valley. Finally in 1911 and 1912 Congress made appropriations for the establishment of the refuge. It is now under the administration of the Fish and Wildlife Service. The refuge consists of 25,000 acres, and last year 1650 tons of alfalfa and other hay-producing plants were fed to the "hay-burners" during the artificial feeding period. The range and the food supply is no longer adequate and one cannot help but wistfully speculate as to the fate of the magnificent primitive remnant of earlier days.

LOREN W. MENTZER

Several letters have been received in recent months asking, in various words and in different degrees of detail, this question: "Where can we find suggestions for worthwhile activities to keep up the interest of our Biology Club?" Evidently many teachers have organized biology or science clubs and have found after the first year or so that the well of ideas tends to run dry. We have not published an article in this field for some time, and are awaiting the arrival of suitable manuscripts. In the meantime, don't hesitate to send any items, however brief, which describe ideas that have worked for you and which you feel you would like to share with other teachers.

RECENT PUBLICATIONS

Annual Report of the National Foundation for Infantile Paralysis. 120 Broadway, New York 5, New York. 78 pp. 1946.

An excellent overview covering the period from June 1, 1945, to May 31, 1946, of the infantile paralysis problem—where the epidemics were, how they were handled, methods of individual care, types of work underway, how the money was spent, and the personnel responsible for the various activities.

GRUENBERG, BENJAMIN C. *How Can We Teach About Sex?* Pamphlet No. 122, Public Affairs Committee, Inc., 22 East 38th Street, New York 16, New York. 32 pp. 1946. 10 cents.

A brief analysis of the present situation, giving some of its causes; the difficulties and the errors of some of the past methods; the role of the school in relation to the home and church; and some important "do's and don'ts"—sex is not a disease for medicine, or a subject like history or arithmetic; the new developments, approaches and future problems, including the training of leaders; a classified reading list.

STOLZ, CHARLES E. *Stop! Look and Listen!* Bulletin 47, Bureau of Educational Research, College of Education, University of Florida, Gainesville, Florida. 11 pp., mimeo. 1946.

A report of the program of audio-visual education at the Winter Haven, Florida,

High School, emphasizing the techniques necessary for an effective program, and listing the particular parts of the plan carried out by the principal, by the librarian, by the teachers and by the student operators.

Serving Through Science. The United States Rubber Company. 120 pp. 1946.

The science talks given by American scientists during the intermission period of the New York Philharmonic Symphony Radio Concerts for the 1945 season "The first law of radio is the limitation of time. Each speaker, a practicing scientist distinguished in his field, was restricted by this law. Each found the allotted time all too short for an adequate presentation of his subject. . . . Accordingly, if these talks stimulate, rather than satisfy, an interest in science and the scientific method, they will have accomplished their purpose." After each talk is a brief biographical note about the speaker. Additional copies of "Serving Through Science" or copies of the individual talks may be obtained from The National Science Teachers Association, 1201 Sixteenth Street, N.W., Washington 6, D. C.

NATIONAL COUNCIL ON ELEMENTARY SCIENCE

Regional Meeting, Chicago

Saturday, March 22

Louis XVI Room Hotel Sherman

MORNING SESSION, 9:30–12:30

Glenn O. Blough, *United States Office of Education*, Presiding

The Purposes of Science Education in the Light of the Nature of the Child (Discussion based on second of Chapter 5 of the 46th Yearbook of the National Society for the Study of Education). Dr. WILBUR L. BEAUCHAMP, University of Chicago.

The Setting of Science in the Elementary School Curriculum. Professor DAISY PARTON, University of Alabama.

Panel Discussion based on the contents of Chapter 5 of the Yearbook. Miss ROSE LAMMEL, Rsearch Associate, Teachers College, Columbia University, Presiding.

Topic: What Changes in Our Present Elementary Science Program are Suggested by this Section of the 46th Yearbook?

Panel Members: Miss ELIZABETH HOSKING, Supervisor of Elementary Instruction, Battle Creek, Michigan; Miss OLGA ADAMS, Laboratory School, University of Chicago; Mr. D R. RUCKER, Curriculum Director, Springfield Public Schools, Springfield, Missouri; Dr. DAVID W. RUSSELL, Headmaster, Avery Coonley School, Downers Grove, Illinois.

AFTER SESSION, 2:00–4:00

BERTHA M. PARKER, University of Chicago, Presiding

Procedures in Teaching Elementary Science Professor W. C. CROXTON, State Teachers College, St. Cloud, Minnesota.

Panel Discussion. Dr. GERALD S. CRAIG, Teachers College, Columbia University, Presiding.

Topic: Some of the Most Effective Methods of Instruction in Elementary Science.

Panel Members: Dr. GEORGE HAUPT, State Teachers College, Glassboro, New Jersey; Miss JULIA WETHERINGTON, Division of Instructional Service, State Department of Public Instruction, Raleigh, North Carolina; Dr. FLETCHER WATSON, Graduate School of Education, Harvard University, Cambridge, Massachusetts; Mr. JOHN STERNING, Counsellor on Science and Visual Education, Glencoe Schools, Glencoe, Illinois; Miss GLADYS FORLER, Shorewood Public Schools, Shorewood, Wisconsin.

The American Biology Teacher has no desire to advertise or to "push" any one institution in preference to others, but we believe that the possibilities and experiences of a summer camp can best be brought to the readers by a description, in both words and pictures, of an actual camp. We feel sure that all our readers including the members of the staff of the excellent institution described in this issue, will understand that our objective is to spread information about summer camps. If in the process, the AUDUBON NATURE CAMP receives a certain amount of advertising, well and good. It is our hope that Mr. Lacroix's article may stimulate other similar contributions for future issues of *The American Biology Teacher.*

"*Why don't you publish more short practical items?*" This question comes to the editor more often than any other. The answer

is a simple and straightforward one—if we received more such articles we would publish more. The editor's desk is stacked up for months ahead with long articles, but short ones dealing with practical matters, especially if illustrated, are usually printed very promptly. If you submit such an item the chances of acceptance are much greater than for a long article; in fact we print almost all we receive.

NEW FILMS ON BASIC BIRD STUDY

A new series of six discussional slidefilms, *Basic Bird Studies*, has been produced and made available by THE JAM HANDY ORGANIZATION. This series, a unit of the *Science Adventures* group, provides the teacher or lecturer with a comprehensive, carefully planned foundation for the study of bird life and may be used as a part of the general science course. This series is more than a mere group of bird photographs—it is a time-saving teaching and study "tool" complete in itself and yet designed to tie in with reading materials, experiments and field trips where programs permit. Subjects are:

1. Structure of Birds
2. Adaptation of Birds
3. Birds' Nests
4. Migration of Birds
5. How Birds Serve Man
6. Helping the Birds

For details, write to THE JAM HANDY ORGANIZATION, 2821 E. Grand Blvd., Detroit 11, Michigan.